

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated June 16, 2006. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 5-6 and 10-13 are under consideration in this application. Claim 5 is being amended, as set forth in the above marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention. In particular, a limitation of the purpose of the invention is being deleted from claim 5. Since this limitation does not recite a structural difference to be examined for its patentability weight, the deletion does not change the scope of the Examiner's search.

All the amendments to the specification and the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

Claims 5-6 and 10-12 were rejected under 35 USC § 103(a) as being unpatentable over US Patent No. 5,608,417 to de Vall (hereinafter "de Vall") in view of US Patent No. 6,522,308 to Mathieu (hereinafter "Mathieu"). This above rejection has been carefully considered, but is most respectfully traversed.

The contactless identification of the invention (for example, the embodiment depicted in Figs. 5-6; pp. 6-7, 11-13), as recited in claim 5, comprises: an antenna coil 1; a first capacitor 7; and an IC chip 3 connected to said antenna coil 1 *in series* through said first capacitor 7, said first capacitor 7 having a capacitance $C1 (<C_{in})$ smaller than an input capacitance C_{in} 3A of said IC chip 3 which is formed with variations due to manufacturing factors (p. 6, lines 24-25).

The capacitance $C1$ of said first capacitor 7 complementing to said input capacitance C_{in} 3A of said IC chip 3 to provide a desired resonant capacitance (*"even if the IC chip has a large input capacitance, the capacitor connected in series with the IC chip can make the overall resonant capacitance equivalently smaller"* p. 6, last line to p. 7, line 1).

The invention solves a prior art problem by connecting the IC chip 3 in series with the antenna coil 1 through a capacitor 7. In the prior art, while a certain degree of manufacturing accuracy can be maintained for the inductance of the antenna coil 1, the capacitor 2 formed of the metallic pattern, or the capacitance as a discrete part, the capacitance between connection terminals of the IC 3 and the antenna coil 1, and the capacitance 3A of the IC chip 3 itself inevitably experience variations in a range of 20 % to 30 % due to a variety of factors in the manufacturing. The variations directly affect the resonant frequency as well as the power reception efficiency and communication distance (p. 4, lines 3-13).

According to the invention, the capacitance C1 of the capacitor 7 is smaller than the input capacitance Cin 3A of the IC chip 3. The invention allows the inductance of the antenna coil 1 and the capacitance C1 of the capacitor 7 to predominantly act on the resonant frequency, which inexpensively and significantly reduces the influence on the resonant frequency exerted by variations in the input capacitance 3A of the IC chip 3 due to certain manufacturing factors (p. 6, line 17 to p. 7, line 12; p. 11, line 15 to p. 12, line 9). For example, *“even if the [input] capacitance of the IC chip varies by $\pm 30\%$, the influence on the resonant frequency is largely reduced to approximately $\pm 1\%$ ”* (p. 13, lines 23-25). ”

Applicants contend that the cited references fail to teach or suggest such a “first capacitor 7 (1) connecting between an IC chip 3 and said antenna coil 1 *in series*, and (2) having a capacitance C1 smaller than an input capacitance Cin 3A of said IC chip 3 which is formed with variations due to manufacturing factors” according to the invention.

Regarding the in-series feature, as admitted by the Examiner (p. 5, lines 13-15 of the outstanding Office Action), de Vall places no preference on either an in-parallel arrangement (Fig. 3a), or an in-series arrangement (Fig. 3b), and Mathieu's Fig. 5 merely shows a parallel connection of a capacitor Cs2 and a chip 50, but not an in-series arrangement. As such, Mathieu implicitly prefers the in-parallel arrangement.

As admitted by the Examiner (p. 5, lines 11-12 of the outstanding Office Action), “a skilled artist would recognize that either a parallel or series resonance circuit can be used in place of each other to achieve the same result.” Applicants contend that the inventors of the present invention prefers the in-series arrangement way over Mathieu's in-parallel arrangement for unexpected results provided by the *in-series* arrangement as explained in details as follows in comparison with Mathieu's in-parallel arrangement.

As shown in the equivalent circuit of Applicants' Fig. 5 is depicted as Sketch 1 side by side with Fig. 5 in the attached annotated drawings, the IC chip 3 inherently contains a

resistance element which corresponds to the resistor elements 54 in Mathieu's Fig. 5.

In Sketch 1, the impedance z (R in the sketch) is expressed as Expression (0) as indicated in the attached sheet, where $C2 = C_{in}$. The resonance frequency ω which minimizes the impedance z is expressed as Expression (1). As shown in Expression (1), the resonance frequency ω of the present invention is obtained independently from C_{in} .

On the other hand, in Mathieu's parallel connection circuit (Fig. 5), the resonance frequency ω is expressed as Expression (2). As shown in Expression (2), Mathieu's resonance frequency ω is heavily influenced by C_{s1} representing the capacitance within the chip.

When ω of the invention is equal to Mathieu's resonance frequency ω , the in-series circuit of the invention obtains larger energy (i.e. larger received voltage) than Mathieu's in-parallel circuit, since the coil inductance L is larger in the Expression (1) of the invention due to the limitation of $C1 < C_{in}$ required by the invention. In contrast, Mathieu's C_{s2} of the antenna $> C_{s1}$ of the chip (col. 4, line 33) such that Mathieu's L in Expression (2) is smaller than the L in Expression (1) of the present invention.

Regarding the $C1 < C_{in}$ feature, as admitted by the Examiner (p. 4, last paragraph of the outstanding Office Action), de Vall does not provide "a first capacitor 7 having a capacitance smaller than an input capacitance of said IC chip which is formed with variations due to manufacturing factors, the capacitance of said first capacitor complementing to said input capacitance of said IC chip to provide a desired resonant capacitance". Mathieu was relied upon by the Examiner (p. 5, lines 6-9 of the outstanding Office Action) to teach complementing the effect of the input capacitance of an IC chip to obtain perfect resonance. However, Mathieu does not teach any capacitor having a capacitance smaller than an input capacitance of the IC chip.

Among the four possible combinations of the in-series or in-parallel circuit arrangement in conjunction of the choices of $C1 < C_{in}$ or $C1 > C_{in}$ by one skilled in the art, the inventors of the present invention deliberately selected the combination of the in-series circuit arrangement and $C1 < C_{in}$ to provide the above-discussed unexpected results, which is simply not a matter of obvious design choice as asserted by the Examiner. The presence of the unexpected properties is evidence of nonobviousness. MPEP§716.02(a).

"Presence of a property not possessed by the prior art is evidence of nonobviousness. In re Papesch, 315 F.2d 381, 137 USPQ 43 (CCPA 1963) (rejection of claims to compound structurally similar to the prior art compound was reversed because claimed compound unexpectedly possessed anti-

inflammatory properties not possessed by the prior art compound); Ex parte Thumm, 132 USPQ 66 (Bd. App. 1961) (Appellant showed that the claimed range of ethylene diamine was effective for the purpose of producing " 'regenerated cellulose consisting substantially entirely of skin' " whereas the prior art warned "this compound has 'practically no effect.' ").

Although “[t]he submission of evidence that a new product possesses unexpected properties does not necessarily require a conclusion that the claimed invention is nonobvious. *In re Payne*, 606 F.2d 303, 203 USPQ 245 (CCPA 1979). See the discussion of latent properties and additional advantages in MPEP § 2145,” the unexpected properties were unknown and non-inherent functions in view of Mathieu, since Mathieu does not inherently achieve the same results. In other words, these advantages would not flow naturally from following the teachings of Mathieu, since Mathieu fails to suggest applying a first capacitor 7 connecting between an antenna coil 1 and an IC chip 3 *in series*, and said first capacitor 7 having a capacitance *C1* (*<Cin*) smaller than an input capacitance *Cin* 3A of said IC chip 3.

Applicants further contend that the mere fact that one of skill in the art could rearrange Mathieu to meet the terms of the claims is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for one skilled in the art to provide the unexpected properties, such as “to provide a resonance frequency ω independently from *Cin*”, without the benefit of appellant's specification, to make the necessary changes in the reference device. *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984). MPEP§2144.04 VI C.

Applicants contend that the cited references and their combinations all fail to teach or disclose each and every feature of the present invention as recited in independent claim 5. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present

invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

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